

Effects of Oil on Wildlife and Habitat

The U.S. Fish and Wildlife Service is the federal agency responsible for many of the nation's fish and wildlife resources and one of the primary trustees for fish, wildlife and habitat at oil spills.

The Service is actively involved in response efforts related to the Deepwater Horizon oil spill that occurred in the Gulf of Mexico on April 20, 2010. Many species of wildlife, including some that are threatened or endangered, live along the Gulf Coast and could be impacted by the spill.

Oil spills affect wildlife and their habitats in many ways. The severity of the injury depends on the type and quantity of oil spilled, the season and weather, the type of shoreline, and the type of waves and tidal energy in the area of the spill.

Oil can be categorized into five groups, ranging from very light to very heavy oils. Most oil has a density less than water, so it floats. Oil tends to spread into a thin layer on the water surface as a sheen. Once in the water, oil undergoes weathering, a process that describes the physical, chemical, and biological changes that occur when oil interacts with the environment.



FWS/Drew Wirua

Protective boom deployed at Breton National Wildlife Refuge.

Weathering reduces the more toxic elements in oil products over time as exposure to air, sunlight, wave and tidal action, and certain microscopic organisms degrade and disperse oil. Weathering rates depend on factors such as type of oil, weather, temperature, and the type of shoreline and bottom that occur in the spill area.

Types of Oil

Although there are different types of oil, the oil involved in the Deepwater Horizon spill is classified as light crude. Light crude is moderately volatile and can leave a residue of up to one third of the amount spilled after several days. It leaves a film on intertidal resources and has the potential to cause long-term contamination.

Impacts to Wildlife and Habitat

Oil causes harm to wildlife through physical contact, ingestion, inhalation and absorption. Floating oil can contaminate plankton, which includes algae, fish eggs, and the larvae of various invertebrates. Fish feeding on these organisms can subsequently become contaminated through ingestion of contaminated prey or by direct toxic effects of oil. Larger animals in the food chain, including humans, can consume contaminated organisms as they feed on these fish.

Although oil causes immediate effects throughout the entire spill area, it is the external effects of oil on larger wildlife species that are often immediately apparent.

Species of Concern

Birds and Mammals

Birds such as brown pelicans are likely to be exposed to oil as they float on the water's surface. Oiled birds can lose the ability to fly, dive for food or float on the water which could lead to drowning. Oil interferes with the water repellency of feathers and can cause hypothermia in the right conditions.

As birds groom themselves, they can ingest and inhale the oil on their bodies. While ingestion can kill animals immediately, more often it results in lung, liver, and kidney damage which can lead to death. Bird eggs may be damaged if an oiled adult sits on the nest.



FWS/Tom MacKenzie

Laughing gulls at Breton National Wildlife Refuge. Booms deployed in background.

Scavengers such as bald eagles, gulls, raccoons, and skunks are also exposed to oil by feeding on carcasses of contaminated fish and wildlife.

Long-term effects on birds and marine mammals are less understood, but oil ingestion has been shown to cause suppression to the immune system, organ damage, skin irritation and ulceration, and behavioral changes. Damage to the immune system can lead to secondary infections that cause death and behavioral changes may affect an animal's ability to find food or avoid predators. Long-term consequences can include impaired reproduction potentially impacting population levels.

Sea Turtles

Sea turtles such as loggerheads and leatherbacks could be impacted as they swim to shore for nesting activities.

Shellfish

Oil can be toxic to shellfish including bottom dwelling (lobsters, crabs, etc.) and intertidal (clams, oysters, etc.) species. The bottom dwelling species may be particularly vulnerable when oil becomes highly concentrated along the

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FWS/Nick Wirrea



A brown pelican that had been oiled and then cleaned soars after being released at Pelican Island National Wildlife Refuge near Vero Beach, Florida on 5/10/10.

shoreline. Some can survive exposure, but may accumulate high levels of contaminants in their bodies that can be passed on to predators.

Fish

Fish can be impacted directly through uptake by the gills, ingestion of oil or oiled prey, effects on eggs and larval survival, or changes in the ecosystem that support the fish. Adult fish may experience reduced growth, enlarged livers, changes in heart and respiration rates, fin erosion, and reproductive impairment when exposed to oil. Oil has the potential to impact spawning

success as eggs and larvae of many fish species are highly sensitive to oil toxins.

Plants

Marine algae and seaweed responds variably to oil, and oil spills may result in die-offs for some species. Algae may die or become more abundant in response to oil spills. Although oil can prevent the germination and growth of marine plants, most vegetation appears to recover after cleanup.

Habitat

Oil has the potential to persist in the environment long after a spill event and has been detected in sediment 30 years after a spill. On sandy beaches, oil can sink deep into the sediments. In tidal flats and salt marshes, oil may seep into the muddy bottoms. Effects of oil in these systems have the potential to have long-term impacts on fish and wildlife populations.

The Service responds to oil spills to minimize impacts to trust resources. The Service's work continues long after a spill event occurs. Damage assessments of habitat and wildlife are conducted to find ways that will minimize long-term effects on new generations of wildlife.

Hotlines

For media: Joint Information Center:
713/323 1670 and 713/323 1671

To report claims related to damages:
800/440 0858

To volunteer: 866/448 5816

To report oiled or injured wildlife:
866/557 1401

On the web

The USCG Joint Incident Command:
<http://www.deepwaterhorizonresponse.com/go/site/2931/>

Department of the Interior:
<http://www.doi.gov>

U.S. Fish and Wildlife Service:
<http://www.fws.gov/home/dhoilspill>

<http://www.twitter.com/USFWSSoutheast/>

Tweets related to oil spill under hashtag #oilspill

<http://www.facebook.com/pages/US-Fish-and-Wildlife-Service/282/48315774>

FWS/Tom MacKenzie



BP contractors loading protective booms in Venice, Louisiana on 4/30/10 to be deployed in the Gulf of Mexico.

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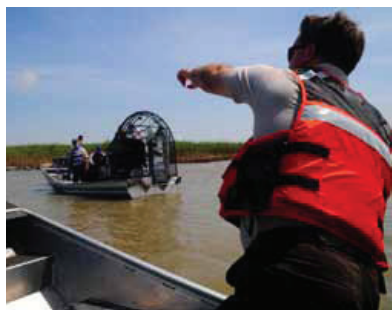
Oil Spill Response



U.S. Fish and Wildlife Service veterinarian Dr. Sharon Taylor and Robert Love of the Louisiana Department of Wildlife and Fisheries prepare to release a Green Heron into the wild after being cleaned at a Wildlife Rehabilitation Center in Ft. Jackson, La. photo: Thomas Gresham.

The Fish and Wildlife Service's Role in Oil Spill Response

During spills, the U.S. Fish and Wildlife Service protects threatened and endangered species, migratory birds, and certain fish, marine mammals, and sea turtles. As a major federal landowner, we are also responsible for preparing for and responding to oil spills that may impact the 150 million acre National Wildlife Refuge system. We provide scientific and technical advice to Coast Guard, the Environmental Protection Agency, state fish and wildlife agencies, and responsible parties support their efforts to contain spills. We also work with our partners and co-trustees, such as the National Oceanic and Atmospheric Administration, other Department of the Interior bureaus,



Jason Duke, a geographic information systems coordinator with the Service, directs an airboat to search for oil off the coast of South Pass, La. photo: Petty Officer 3rd Class Stephen Lehmann.

states, and Indian tribes to help response personnel avoid or minimize injury to natural resources.

Guiding Response Actions to Protect Habitats and Sensitive Species

Our field biologists's intimate knowledge of local resources and sensitive ecological areas makes us invaluable to those directing response activities, prioritizing spill countermeasures, and conducting clean-up work. Our advice is particularly valued when wetlands, refuge lands, federally listed species, migratory birds or the habitat supporting these species are potentially or physically impacted.

Leading the Survey, Capture and Rehabilitation of Oiled Wildlife

We work together with responding agencies by taking a leading role in wildlife protection. Field staff use a variety of methods to deter wildlife, especially birds, from oiled areas. This may include hazing techniques such as scare balloons, propane cannons or other noise makers, and air boats. We also conduct surveys to determine where oiled birds and wildlife may be found, and assist with their safe capture and transportation to rehabilitation centers. Service staff work with the appropriate agencies to oversee wildlife rehabilitation contractors as they clean oiled birds and wildlife and return healthy individuals back to the wild.

The Current Spill

We continue to support the joint agency response to the Deepwater Horizon oil spill in the Gulf of Mexico. The Service has many experienced technical specialists, scientists, land managers, and support personnel involved in the oil spill response. The Service is taking aggressive steps to protect ecologically sensitive areas on the Gulf Coast national wildlife refuges that potentially could be impacted.

Oversight of Wildlife Rehabilitation

Under the Oil Pollution Act of 1990, the responsible party – BP in the current case – is charged with hiring and funding firms to handle the many jobs required by a spill such as this, including wildlife rehabilitation. BP has hired Tri-State Rescue and Research and the International Bird Rescue Research Center; well-respected service providers that operate under existing permits issued by the Service. They work closely with the Service and state fish and wildlife agencies to compile data accurately, complete necessary testing and support field activities aimed at

saving as many birds and wildlife as possible. Federal agencies, including the Service, are providing oversight of BP's efforts in this and other areas.

Effective Training and Planning

To ensure the safety of our responders, Service staff are trained and provided the resources required to integrate their activities within the larger response effort. We also participate in pre-spill planning and coordination efforts of Regional Response Teams. This participation helps us maintain a strong working relationship with our response partners.

A Continued Commitment to Conservation

The Service remains committed to its role as a partner in conserving America's natural resources. Effectively responding



Containment boom is staged at the Breton National Wildlife Refuge.

to oil spills is a key element of this commitment, and effective response involves building solid relationships with our partners and ensuring that our people are trained and ready to act when a spill occurs.

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May 2010



Breton National Wildlife Refuge

and the 2010 Gulf Oil Spill



photo: USFWS

Protective boom surrounds an island at Breton NWR.



photo: USFWS

Oil on beach at part of Breton NWR.



photo: Byron Fortier

Brown Pelicans loafing just off the beach at Breton.



photo: USFWS

Brown Pelicans nesting.

Refuge Facts

- Established in 1904 through executive order of President Theodore Roosevelt; second-oldest refuge among the over 540 in the National Wildlife Refuge System. Only refuge visited by Roosevelt, in 1915.
- Acres: 13,000 in St. Bernard and Plaquemines parishes. Wilderness designated 1975, 5,000 acres.
- Largest tern colony in the nation. Important area for Reddish Egrets. Nesting habitat for various other colonial seabirds. Large non-breeding concentration of Magnificent Frigatebirds. Concentration of Redhead Ducks with a few Canvasbacks and scaups.
- Refuge consists of barrier islands located in the Gulf of Mexico off the southeast coast of Louisiana.
- Largest nesting colony of Brown Pelicans in the southeast region. Pioneering research underway to study bird movements, distribution, and breeding ecology.

The Gulf of Mexico Oil Spill

On April 20, 2010 a drilling rig explosion led to uncontrolled leaking of oil into the Gulf of Mexico in the vicinity of Breton NWR. The federal government, including the U.S. Fish and Wildlife Service, along with state and local governments and private citizens, are working to limit the impacts to coastal ecosystems along the northern Gulf of Mexico.

Questions and Some Answers

What are the public use impacts of the spill at Breton NWR?

The refuge is closed to all public use at this time. Increased disturbance and visitation can jeopardize nesting success of the Pelicans and Terns. The air space above the refuge has aircraft restrictions.

What are the immediate threats to the Refuge and its wildlife?

Beached oil or oil sheen on the water can impact wildlife. Oil on the birds can decrease their feathers' waterproofing and even small amounts if ingested can kill the birds. Brown Pelicans are especially at risk because they dive into the water for fish and can easily get coated with oil.

Oil on the eggs of nesting birds can coat and suffocate the developing chicks inside - even a light coating of oil can kill developing eggs. The nesting season for pelicans and terns is from March through August. Oil suspended in the water can kill both fish and aquatic vegetation. Oil on the island vegetation can kill it, decreasing habitat and increasing erosion of the islands.

What are some tools that the refuge is using to deal with the oil spill?

Staff continuously monitor for presence of oil. Both hard and soft boom is used to keep oil away from the islands. Absorbent boom is used to collect oil that reaches land. The booms require constant maintenance and repair and do not work well in rough waters.

What are the long-term impacts of this spill?

We do not know for sure, but if the oil kills large amounts of the little animals found at the bottom of the food chain, the animals that photosynthesize and are food for the larger fish who are then food for birds and other animals, then the long-term impacts could be great.

If the suspended or surface oil repeatedly contaminates areas the impacts may be great. The overall impact will depend on the amount of oil and the length of time over which contamination occurs. Oil left on beaches for an extended time is harder to clean and causes greater damage.

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Is there anything you can do to help?

At this current time there is not much an individual person can do to help at Breton NWR. What you can do is stay engaged and informed. Refuge Friends organizations are mobilizing to assist with support on the spill. Contact a local bird rehabilitator and offer assistance. Be prepared to be asked in the future because your help will be needed long term.

Oiling Impacts on Refuge

- Beached oil or oil sheen on the water can impact wildlife. Even a light coating of oil can kill developing eggs.
- Small amounts of oil can kill shorebirds when ingested.
- Oil left on beaches for extended time is harder to clean and causes greater damage.
- Oil suspended in the water can kill both fish and aquatic vegetation.

Oil Spill Management Tools

- Both hard and soft boom is used to keep oil away from the islands
- Absorbent boom is used to collect oil that reaches land.
- Staff continuously monitor for presence of oil.
- Booms require constant maintenance and repair.
- Booms do not work well in rough waters.

Public Use Impacts

- The refuge is closed to all public use at this time
- The air space above the refuge has aircraft restrictions
- Increased interest and visitation can jeopardize nesting success of the Pelicans and Terns.

When is the nesting season for the pelicans and terns?

The nesting season is from March through August.

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Media inquiries:
Joint Information Center:

985/902 5231 and 985/902 5240

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To volunteer: 866/448 5816

For more information about the Service's response and our resources at risk:

<http://www.fws.gov/home/dhoilspill>

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Delta National Wildlife Refuge

and the 2010 Gulf Oil Spill

Refuge Facts

- Established: 1935.
- Acres: 48,800.
- Located in Lower Plaquemines Parish, LA. Nearest town is Venice, LA. Refuge sub-headquarters are located in Venice. Actual refuge location is seven miles south of Venice. Access is by boat only. It requires traveling and crossing the Mississippi River.

Natural History

Refuge is a dynamic landscape that is part of the currently active delta of the Mississippi River. Formation of what is now the refuge began in mid 1800's at Cubit's Gap. Refuge was established as a bird sanctuary. An abundance of ducks, geese, raptors, wading birds, shorebirds, and several bird rookeries are on the Refuge. Refuge is composed of fresh-to-brackish marsh habitat nurtured by rich Mississippi River sediments.

Financial Impact of Refuge

- Approximately 7500 visitors in fiscal 2009.

Refuge Purposes

- Provide wintering habitat and sanctuary for waterfowl and other migratory birds.
- To protect and enhance endangered species.
- To restore and preserve marshland habitat.
- To provide compatible consumptive and non-consumptive public use.

The Gulf of Mexico Oil Spill

On April 20, 2010 a drilling rig explosion led to uncontrolled leaking of oil into the Gulf of Mexico in the vicinity of Delta NWR. The federal government, including the U.S. Fish and Wildlife Service, along with state and local governments and private citizens, are working to limit the impact to coastal ecosystems along the northern Gulf of Mexico.



Workers place absorbent boom on Delta NWR, photo by USFWS/Drew Wirwa.

Questions and Answers

What are the public use impacts of the spill at Delta NWR?

A portion of the refuge is closed due to an earlier, unrelated pipeline rupture that occurred in early April. The remainder of the refuge is open.

What are the immediate threats to the Refuge and its wildlife?

There is potential for oil damage to marsh vegetation. The areas most likely to be impacted are outer fringes of the Refuge which border the Gulf of Mexico. Interior marsh areas are more protected, and benefit from outflows of water from the Mississippi River which tend to push oil away. External marshes are composed mainly of Roseau cane (phragmites) which grows in deeper waters and is less prone to root damage from oil. Interior marshes contain important food plants such as delta duck potato and three-square which are relied upon by many waterfowl and wading bird species. These marshes could be seriously impacted in the event of a large storm event that pushed oil deeper into the refuge. If marsh vegetation dies, erosion can occur rapidly as these plants hold the marsh together.

Beached oil or oil sheen on the water can impact wildlife. Oil on birds can decrease their feathers' waterproofing and even small amounts of fresh oil if ingested can kill the birds. Weathered oil is less of a threat as volatile compounds diminish with exposure to the elements. Birds that dive for aquatic foods are especially at risk because they can easily get coated with oil.

Oil on the eggs of nesting birds can coat and suffocate the developing chicks inside - even a light coating of oil can kill developing eggs. If chicks are exposed to oil they are more impacted than adults due to their lack of well-developed protective feathers.

What are some of the bird species potentially at risk on Delta NWR?

Secretive marsh birds such as rails, gallinules, and moorhens are nesters on the refuge. Egrets nest in taller willows along the banks of waterways. Resident waterfowl species currently nesting on the refuge include mottled ducks and black-bellied whistling ducks. Many other species of migrating ducks and geese winter on Delta Refuge, and will begin arriving this fall.

U.S. Fish & Wildlife Service

If oil is present then, there is potential for great impact to these wintering birds.

What are some tools that the refuge is using to deal with the oil spill?

Staff continuously monitors for presence of oil. Both hard and soft boom is used to keep oil away from the marshes. Absorbent boom is used to collect oil that reaches land. As the exterior Roseau cane marshes are less susceptible to oiling damage, some booms have been pulled further in to protect more vulnerable interior marshes.

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Hard boom and absorbent boom require frequent monitoring to ensure effectiveness, photo by USFWS/Drew Wirwa.

